

FIRST ANNUAL REPORT

OF THE

NORTH DAKOTA

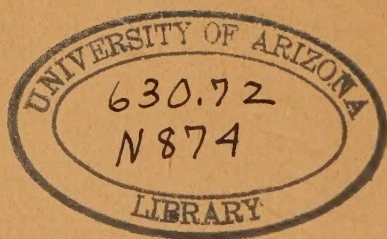
AGRICULTURAL EXPERIMENT STATION.

FEBRUARY 1ST, 1891.

FARGO, N. D.

TO THE GOVERNOR.

FARGO, N. D.:
THE DAILY REPUBLICAN PRINT,
1891.



HON. O. W. FRANCIS,

President Board of Control,

North Dakota Agricultural Experiment Station.

SIR: I take pleasure in submitting herewith my first Annual Report as Director of the North Dakota Agricultural Experiment Station, the same being due on or before February 1, 1891, and called for by the requirements of section three (3) of an Act of Congress entitled "An act to establish Agricultural Experiment Stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and of acts supplementary thereto." This being the so-called "Hatch Act" approved March 2, 1887.

Very respectfully,

H. E. STOCKBRIDGE.

January 31, 1891.

HIS EXCELLENCY, HON. A. H. BURKE,

Governor of North Dakota.

SIR: I herewith present the Annual Report of the Board of Control of the North Dakota Agricultural Experiment Station, made in accordance with the provisions of the Acts of Congress, approved March 2, 1887, and of the Legislature of North Dakota, approved March 8, 1890.

Respectfully yours,

O. W. FRANCIS,
President of the Board.

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION.

BOARD OF CONTROL.

O. W. FRANCIS, President, Fargo.

J. B. POWER, Secretary, Power P. O.

E. M. UPSON, Cummings.

J. D. WALLACE, Drayton.

M. J. SANDERSON, Edgeley.

STATION STAFF.

H. E. STOCKBRIDGE, Ph. D., Director.

E. F. LADD, B. S., Chemist.

T. D. HINEBAUCH, M. S., V. S., Veterinarian.

C. B. WALDRON, B. S., Arboriculturist.

H. L. BOLLEY, M. S., Botanist.

To the Board of Control:

The act of Congress* calling this station into existence makes the rendering of a report on or before the first day of February of each year imperative. In compliance with the provisions of the law, I now beg leave to submit the report of the North Dakota Agricultural Experiment Station for the year 1890.

The annual report must hereafter be accompanied by a financial statement for the Government fiscal year ending with the 30th of June preceding the date of the report. Our station, however, having been organized too late in the year to entitle it to any part of the Government appropriation for the year ending with the 30th of last June, no financial report can be now made, the station being now in the enjoyment of funds from the appropriation made for the year ending June 30th, 1891, the report for the expenditure of which will not be made until February 1, 1892, and will therefore form a part of the next annual report of the station.

The station having been called into existence so late in the season as to have precluded to a very great extent the actual accomplishment of investigation during the past year, the present report must necessarily consist almost exclusively of a narration of the organization of the station, the record made toward its equipment, and the plans adopted for its future work.

ORGANIZATION.

The legislative act under which this station is organized was approved March 8, 1890. The Board of Control appointed by the Governor, in compliance with this act, met for the purpose of organization May 1, 1890, and was constituted as follows: O. W. Francis, Fargo, president; J. B. Power, Power P. O., secretary; E. M. Upson, Cummings; J. D. Wallace, Drayton, and M. J. Sanderson, of Edgeley.

At an adjourned meeting held on May 15, 1890, the Board of Directors voted to "appoint a station staff for temporary service, and complete without delay the necessary preparations for immediate commence-

*Congressional and State acts are both appended to this report.

ment of work of the Experiment Station, and to have the same carried on as far as practicable the present season. In the furtherance of this vote, Dr. S. T. Satterthwaite was appointed director, with Messrs. James Holes and Jacob Lowell as assistants."

Under this arrangement 40 acres of land were leased for the season, and crops of wheat, oats, grass, fodder-corn and sugar beats were put in; the work with grass and wheat being in the direction of variety tests. It was hoped that the work accomplished previous to July 1, 1890, would entitle the station to an income for the fiscal year ending June 30th. The Secretary of the Interior, however, failed to recognize the undertaking as complying with the provisions of the law, and would not sanction the payment of funds for the work accomplished. The income of the station, therefore, began with the present Government fiscal year, the first payment received from the United States Treasury having been for the quarter ending September 30, 1890. All payments made in compliance with the provisions of Congress relating to experiment stations having, previous to January 1, 1891, been made at the end instead of the beginning of the quarter for which they were due.

The temporary organization effected to meet the emergencies existing, terminated October 15, 1890, and on that date the present director and the permanent staff of the station assumed charge of its work. The staff thus organized being as follows: H. E. Stockbridge, Ph. D., Director; E. F. Ladd, B. S., Chemist; T. D. Hinebauch, M. S. V. S. Veterinarian; C. B. Waldron, B. S., Arboriculturist; H. L. Bolley, M. S., Botanist. Additions to the staff will be made as required, one, at least, and he in many respects filling the most important position of all, as Agriculturist, will be on the ground in season for the beginning of out of door work the coming season.

WORK IN PROGRESS.

No definite data are on record concerning the crop work of the last season. The plots sown to different varieties of grass, however, could not furnish data until the present year, but from the beginning already made, valuable results are hoped for in the future, as

the observations will continue until definite results are reached. The sugar beets grown produced a yield fully equal to the European average, and analyses just completed by the station chemist, by the most approved methods known, and by apparatus imported from Germany for this express purpose, give a sugar content of 13.8 per cent., while the German average, under like methods of treatment, is 12.2 per cent. This work will be continued the coming season. It may not be inappropriate to state, however, that there is every reason for believing that in yield per acre, and sweetness of juice, North Dakota beets exceed the European product, and that the question of their economical utilization for sugar production is, therefore, fundamentally a manufacturing rather than an agricultural problem. The question of the economical conversion of the raw product into marketable sugar remaining a yet unsolved problem, toward the solution of which the station will nevertheless lend every effort and make every exertion.

On July 17th Professor C. B. Waldron began the collecting and classifying of portions of the local flora under an engagement with the station authorities. In this work special attention has been given to the native grasses and to the weeds likely to prove injurious; of the former some forty species have been collected, two or three of which have never been catalogued. Outside of the grasses about one hundred and fifty species were collected. Aside from the collecting done in the Red River Valley, collecting trips were made to the vicinity of Devils Lake, the Turtle Mountain region, and to the Missouri River Valley north of Bismarck. Professor Waldron is a permanent member of the staff of the station, and the work begun during the past season will be continued in the future, and from it results of great value to the farming community of the State may be assured. In the

BOTANICAL DEPARTMENT,

aside from the study of native flora, particular attention is being given to the study of crop diseases, especially of grains. Smuts and rusts, frequently so destructive to wheat, oats and barley, and from which North Dakota farmers have not

and cannot wholly escape, are receiving special study, with the hope of ultimate protection against their ravages; protection from injury by smut being already a reasonably assured fact. The disease or difficulty from which flax so commonly suffers, and which has proved a serious drawback to successful flax growing, is also the subject of special investigation. In the

CHEMICAL DEPARTMENT,

investigation in the line of dairying, milk, cheese and butter production, and the economical utilization of both indigenous and introduced fodder crops already occupy much attention. A thorough and systematic investigation of the composition, and physical and chemical characteristics of wheat have been undertaken, and will be continued with the hope of establishing a definite and accepted method for the simple and positive determination of grade in the buying and selling of wheat, the result of which would be the prevention of controversy between buyer and seller, the protection of producer against unscrupulous purchaser, and of honest dealer against the unfavorable influence of dishonest buyers. In short, to establish between producer and consumer of wheat as definite and thoroughly recognized relations as exist in the milk or sugar trades, and in the buying or selling of potatoes for starch manufacture, in each of which industries a positive, absolute and fixed standard of value exists, recognized by both parties to the transaction, and impossible of controversion.

Beet sugar production, and the utilization of both fibre and seed of the flax plant, the analysis of soils, minerals, waters, and agricultural products, are receiving and will continue to receive the attention and effort of the chemical department. The

VETERINARIAN

has now in progress investigations of black leg and tuberculosis, against the ravages of which protection is sought.

In addition to the work here recorded as already in progress, a thorough system of investigation and experiment has been mapped out, including extensive

field work, which, from the diversity of soil and climatic conditions found in our state, must be conducted in numerous different localities, as the work of the institution is distinctively undertaken in the interests of the agricultural community of the entire State, the State at large, and not of a single locality.

EQUIPMENT.

On the 15th of October last the station was without a home, without a permanent organization, and possessed of absolutely no equipment whatever for the conduction of the great work recognized as lying before it, and had never received any portion of its national income. To-day it is occupying conveniently arranged and well equipped offices and laboratories, supplied with the best of apparatus and appliances for the conduction of its investigations, and with the leading scientific and agricultural publications and journals of the world at the disposal of its workers, and is in regular receipt of the income appropriated by Congress for the accomplishment of the purposes for which the station was organized. The all essential possession of land, however, is as yet wanting, though before the exigencies of the opening season arise, it is expected that the wisdom of the legislature will have placed us in possession of this absolute requisite to successful work.

CONCLUSION.

It would be out of place to enter into lengthy detail of arrangements made, or plans adopted for future work, other than the facts already stated as a report of progress. The management of the station is fully impressed with the importance of the work undertaken, the magnitude of the field to be occupied, and the manifold directions in which the work of the station may be expected to develop, and from which the State may reasonably expect and rightfully demand assistance. We recognize that the institution must be strictly agricultural, and that its work, to meet with public approbation, must be of a positively practical character, and every member of the station staff is fully imbued with the ideas expressed, and the staff will exert itself as a unit toward the accomplishment of definite practical results of value to the

intelligent farmers of North Dakota. In work of the nature we have undertaken, however, the element of time must be recognized, and allowances made for this factor in the accomplishment of positive results.

The work of the institution is as positively defined by act of Congress as its income is restricted. Of the \$15,000 annually received, \$750 only per annum may be used for the erection, repair or maintenance of buildings. With the single exception of the first year, when \$3,000 of this fund may be thus utilized. Buildings, however—barns, laboratories and offices—are absolutely essential to the proper conduction of the enterprise. Without them results cannot be successfully reached, and, if the work assigned us is not accomplished, all unexpended funds at the end of the fiscal year revert to the United States treasury whence they came.

The public has a right to be interested in and made acquainted with the work of the station, and every farmer of the State is entitled to all publications of the station, on request, the same being forwarded him through the mails free of charge. As yet no results of actual experiments undertaken are of such a nature that publication would benefit the community. The first station Bulletin, however, will be ready for distribution in a few days, and deals chiefly with the characteristics, prevalence, and prevention of the smut of wheat and oats, it being our aim to render the farmers of the State practical assistance, as well from the work of other similar institutions, as from our own. And in closing this first report of the North Dakota Agricultural Experiment Station, we wish to impress upon the attention of the farmers of the State that this institution belongs exclusively to them, that it receives its income for the sole purpose of being expended in their aid, that in its work their desires and interests will be constantly furthered, and that their interest, assistance and suggestions are earnestly desired, solicited and expected.

H. E. STOCKBRIDGE,

Director.

January, 31, 1891.

AN ACT

To establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and of the acts supplementary thereto.

SECTION 1. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and application of agricultural science, there shall be established, under direction of the college or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July 2, 1862, entitled, "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station:" *Provided*, That in any State or Territory in which two such colleges have been or may be so established, the appropriation hereinafter made to such State or Territory shall be equally divided between such colleges, unless the legislature of such State or Territory shall otherwise direct.

SECTION 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soil and waters; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative

effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches and experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions or needs of the respective States or Territories.

SECTION 3. That in order to secure, as far as practicable, uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigations or experiments; to indicate, from time to time, such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the purposes of this act. It shall be the duty of each of said stations annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located a full and detailed report of its operations, including statement of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the Commissioner of Agriculture, and to Secretary of the Treasury of the United States.

SECTION 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the State or Territory in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster General may from time to time prescribe.

SECTION 5. That for the purpose of paying the necessary expense of conducting investigations and experiments and printing and distributing the results

as hereinbefore prescribed, the sum of \$15,000 per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of section eight of this act, out of any money in the Treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year, to the Treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the 1st day of October, 1887. *Provided*, however, That out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

SECTION 6. That whenever it shall appear to the Secretary of the Treasury from the annual statement of receipts and expenditures of any of said stations that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such station, in order that the amount of money appropriated to any station shall not exceed the amount actually and necessarily required for its maintenance and support.

SECTION 7. That nothing in this act shall be construed to impair or modify the legal relation existing between any of said colleges and the government of the States or Territories in which they are respectively located.

SECTION 8. That in States having colleges entitled under this section to the benefits of this act and having, also, agricultural experiment stations established by law separate from said colleges, such States shall be authorized to apply such benefits to experiments at stations so established by such States: and in case any State shall have established, under the provisions of said act of July 2d aforesaid, an agricultural department or experiment station, in connec-

tion with any university, college, or institution, not distinctively an agricultural college or school, and such state shall have established or shall hereafter establish a separate agricultural college or school, which shall have connected therewith an experimental farm or station, the legislature of such State may apply in whole or in part the appropriation by this act made, to such separate agricultural college or school, and no legislature shall, by contract express or implied, disable itself from so doing.

SECTION 9. That the grants of money authorized by this act are made subject to the legislative assent of the several States and Territories to the purposes of said grants: *Provided*, That payments of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of its legislature meeting next after the passage of this act shall be made upon the assent of the Governor thereof, duly certified, to the Secretary of the Treasury.

SECTION 10. Nothing in this act shall be held or construed as binding by the United States to continue any payments from the treasury to any or all the States or institutions mentioned in this act but Congress may at any time amend, suspend or repeal any or all the provisions of this act.

Approved March 2, 1887.

The provisions of this act of Congress were accepted, and steps taken to enable the State to avail itself of the advantages offered, by the following act of the first legislature of the State of North Dakota, entitled "An Act to Provide for the Establishment, Erection and Operation of the North Dakota Agricultural College and Agricultural Experiment Station at Fargo."

The following two sections only refer directly to the Experiment Station:

SECTION 16. There is hereby established an agricultural experiment station in connection with the North Dakota Agricultural College, and under the direction of the Board of Directors of said college, for the purpose of conducting experiments in agriculture, according to the terms of section one (1) of an act of

Congress, approved March 2, 1887, and entitled "An act to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and of the acts supplementary thereto."

SECTION 17. The assent of the Legislative Assembly of North Dakota is hereby given, in pursuance of the requirements of section nine of said act of Congress, approved March 2, 1887, to the grant of money therein made, and to the establishing of an experiment station, in accordance with section one of said last mentioned act, and assent is hereby given to carry out, all and singular, the provisions of said act.

Approved March 8, 1890.

